Effectiveness of Self-Care Interventions in Managing Chronic Diseases: A Systematic Review

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ABSTRACT

Chronic conditions, including heart failure, diabetes mellitus, and hypertension, account for 71% of global deaths and present major challenges to healthcare systems, making self-care interventions essential for improving disease management and outcomes. This systematic review evaluates the effectiveness of self-care interventions in managing chronic diseases by synthesizing evidence from randomized controlled trials, observational studies, and systematic reviews. Literature search was conducted across PubMed, Cochrane Library, and Google Scholar to identify English-language studies examining self-care interventions in adults with chronic illnesses. Eligible studies included those focusing on diabetes mellitus, hypertension, heart failure, and related conditions, with outcomes assessing self-care behaviors, clinical indicators, quality of life, and healthcare utilization. Screening, data extraction, and quality assessment were performed independently by two reviewers following PRISMA guidelines. Twenty-two studies meeting inclusion criteria involved diverse interventions such as telemonitoring, nurse-led education, mobile health applications, and theory-driven behavioral programs, encompassing over 50,000 participants globally. Consistent improvements were observed in self-care behaviors and quality of life, with significant positive effects on clinical outcomes including glycemic control, blood pressure, and symptom management. Notably, telemonitoring and nurse-led supportive programs showed sustained benefits in heart failure populations. Reductions in hospital readmissions and symptom burden further indicated enhanced disease control and patient well-being. However, heterogeneity in intervention design and outcome measures limited comparability across studies. Self-care interventions are effective in improving behavioral, clinical, and quality-of-life outcomes in adults with chronic diseases, particularly heart failure. Integration of technology and personalized education appears beneficial, yet standardized intervention frameworks and further research are needed to optimize strategies across diverse chronic conditions and healthcare settings.

Keywords: self-care, chronic disease, diabetes mellitus, hypertension, telemonitoring, nurse-led intervention

1. INTRODUCTION

The global rise in chronic diseases presents a significant public health challenge, with profound implications for healthcare systems, patients, and caregivers. The global rise in chronic diseases presents a significant public health challenge, with profound implications for healthcare systems, patients, and caregivers. According to the World Health Organization [1], self-care refers to the ability of individuals, families, and communities to promote health, prevent disease, maintain well-being, and cope with illness or disability, either independently or with the support of a healthcare provider. Lee et al. [2], noted that self-care interventions are moderately effective in improving health outcomes and play an important role in chronic disease management. Theoretically, self-care encompasses three key types of behaviour: maintenance behaviours, which involve adhering to therapies and preventive health measures to maintain stability in chronic conditions; monitoring behaviours, which include vigilant observation for signs and symptoms of the condition [3]; and management behaviours, which entail recognising and responding appropriately to symptoms in order to improve prognosis and overall wellness in chronic illness cases. Effective self-care also necessitates slowing disease progression, detecting changes early, and implementing timely behavioural adjustments as they occur [4].

Non-communicable diseases (NCDs), including diabetes, cardiovascular disorders, cancer, and chronic respiratory conditions, account for approximately 71% of annual deaths worldwide, with a disproportionate burden in low- and middle-income countries [5-7]. These long-term, progressive conditions not only contribute to disability and reduced quality of life but also impose substantial economic costs on individuals and health systems [8,9]. Effective management therefore requires sustained patient engagement, comprehensive care strategies, and robust preventive measures [10,11]. Self-care interventions have emerged as a cornerstone of chronic disease management, empowering individuals to actively participate in their health through medication adherence, lifestyle modification, symptom monitoring, and psychological coping [12-14]. Evidence from systematic reviews and meta-analyses demonstrates that such interventions improve clinical outcomes, enhance self-efficacy, reduce depressive symptoms, and lower healthcare utilisation [15,16].

Despite their proven potential, the effectiveness of self-care is influenced by patient characteristics, intervention design, and contextual factors, leading to variability in outcomes across studies [17,18]. Moreover, the integration of self-care strategies into clinical practice remains inconsistent, and opportunities exist to leverage technology for greater personalisation and accessibility [19,20]. Against this background, this systematic review synthesises evidence from high-impact studies to evaluate the effectiveness of self-care interventions in chronic disease management, identify determinants of success, and highlight gaps for future research, with the goal of informing policy and optimising patient-centred care globally.

2. METHODS

This systematic review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines [21]. The protocol focused on synthesising evidence regarding the effectiveness of self-care interventions in the management of chronic diseases. Studies were included if they met the following criteria: (i) randomised controlled trials (RCTs), observational studies (cohort and case-control), or systematic reviews; (ii) adults (≥18 years old) diagnosed with chronic diseases, including diabetes mellitus, hypertension, and heart failure, using standardised diagnostic criteria or verified self-reports; (iii) self-care strategies such as medication adherence, lifestyle modifications, symptom monitoring, and psychological coping; (iv) conducted in non-acute

environments (e.g., community, outpatient, or primary care). Hospital-based studies were eligible only when interventions were assessed post-discharge; (v) reported clinical outcomes, quality of life, self-efficacy, healthcare utilisation, or disease progression indicators. Studies were excluded if they (vi) focused on acute conditions, paediatric populations, terminal illnesses, or complex comorbidities where self-care impact could not be isolated; (vii) were case reports, editorials, expert opinions, or lacked empirical outcome evaluation; (viii) did not provide disease-specific results for the target chronic conditions.

English-language articles published between January 2020 and December 2024 were searched in August 2025 using PubMed and the Cochrane Library; grey literature was explored via Google Scholar. Search terms in PubMed combined MeSH headings and keywords. The strategy incorporated the following concepts: (i) self-care, (ii) chronic disease, (iii) intervention, and (iv) effectiveness. Boolean operators (AND, OR) and truncation were applied to optimise results. Reference lists of key studies were manually screened to identify additional eligible studies. All identified records were imported into reference management software, which removed most duplicates; the remaining duplicates were deleted manually. Screening occurred in three stages. First, two authors (AMO and AO) independently excluded irrelevant articles based on titles. Second, abstracts of the remaining articles were reviewed. Although review articles were not eligible, their reference lists were searched for additional literature. Third, full-text reviews were conducted by AMO and AO to confirm eligibility. Discrepancies were resolved through discussion at each stage, and further disagreements were addressed until consensus was achieved. Data were extracted using a customised Microsoft Excel template, capturing the following: (i) study characteristics (author, year, country, design); (ii) participant demographics (age, gender, sample size); (iii) intervention details (type, duration, delivery method); and (iv) reported outcomes and key findings. Two researchers independently extracted the data to ensure accuracy.

3. RESULTS

The literature search identified a total of 3,142 articles through database searches and manual reference list checks (see Figure 1). After the removal of 812 duplicates, 2,330 records remained for screening. Title and abstract screening resulted in the exclusion of 2,156 articles that did not meet the inclusion criteria. The remaining 174 full-text articles were assessed for eligibility. Of these, 152 studies were excluded because the reported outcomes were not relevant (n = 67), the study design was inappropriate (n = 49), or the intervention did not meet the predefined definition of a self-care intervention (n = 36). Finally, 22 studies were included in this review.

Study characteristics

A total of 22 studies were included [2,22–42]. The final set comprised 13 randomised controlled trials (RCTs), six systematic reviews or meta-analyses, one quasi-experimental study, one retrospective cohort study, and one qualitative longitudinal study. The included studies spanned a wide range of geographical regions, with research conducted in Asia, Europe, the Middle East, Africa, and in some cases, multi-country collaborations. Across all designs, the total sample size exceeded 50,000 participants.

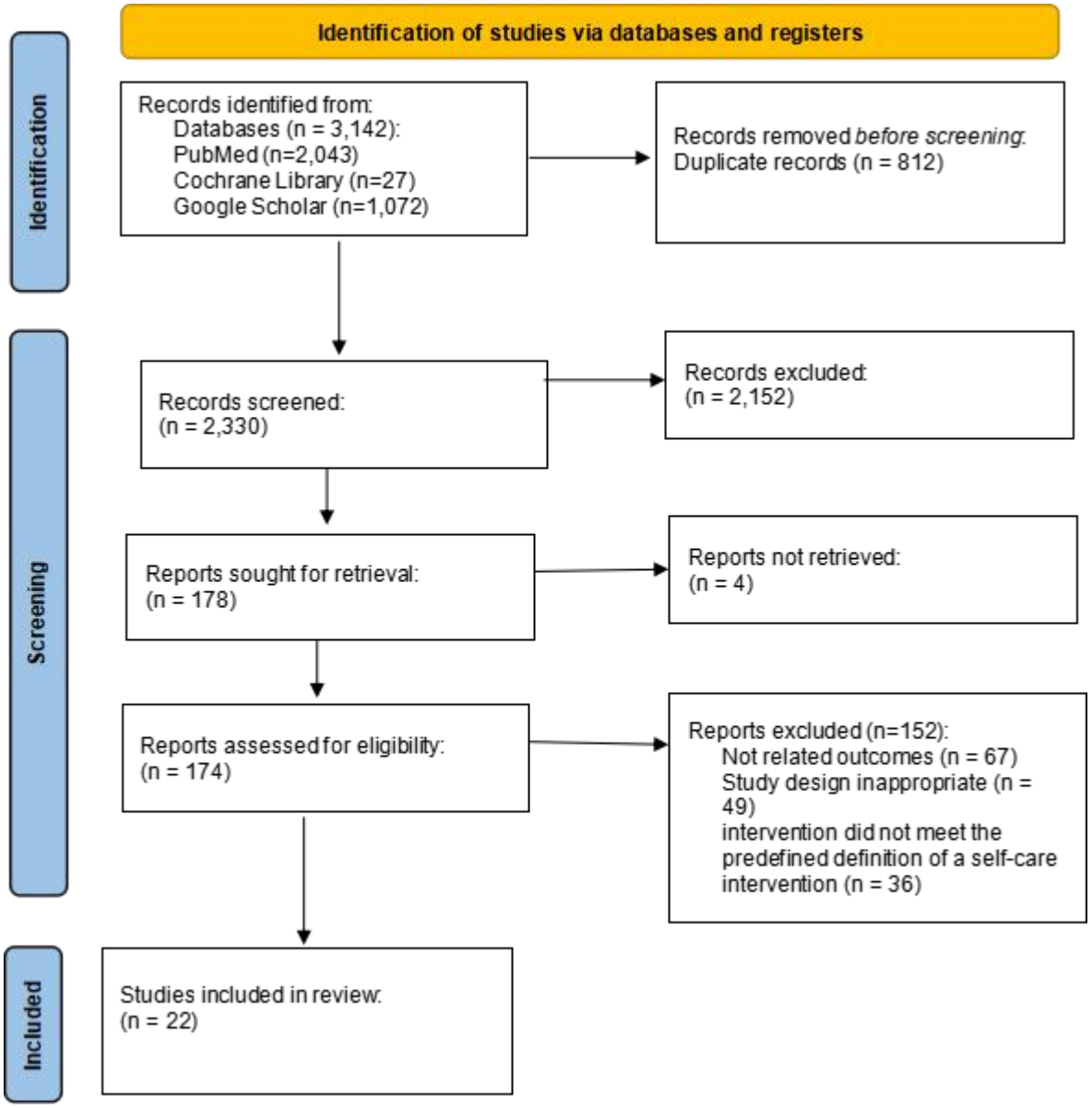

Figure.1. PRISMA 2020 flow diagram.

Population/participants

The most common groups of patients included in the studies were adults with heart failure (HF) [22–27], type 2 diabetes mellitus (T2DM) [25], hypertension [28], chronic kidney disease (CKD) [28], chronic obstructive pulmonary disease (COPD) [28], and other chronic illnesses (see Table 1). Intervention strategies varied but shared a central focus on enhancing self-care behaviours. Common approaches included digital health tools such as mobile applications [23, 27, 41] and telemonitoring devices [27, 39], nurse-led educational [28, 29] and supportive care programmes [25], theory-driven educational modules [26, 30], structured follow-up via telephone or home visits [29], and behavioural change facilitation [24, 26] (see Table 2).

Table 1 Summary of included studies, design, population and key variables

Authors & Year	Country	Study Design	Sample Size	Population	Comparator	Duration
Ye et al., 2024	China	RCT	174	Adults with T2DM & hypertension	Standard diabetes education	26 weeks
Han et al., 2023	China	Open-label RCT		Adults with poorly controlled T2DM (HbA1c 7–11%)	Standard SMBG	1 year
Lee et al., 2022	Netherlands	Meta-analysis of 145 RCTs	36,853	Adults with chronic diseases (diabetes, HF, hypertension, asthma, CAD, COPD)	Usual care/minimal contact	4 weeks–24 months
Huang et al., 2024	China	Systematic review & meta-analysis	7,603	Adults with various chronic diseases	Standard follow-up	6–12 months
Okpako et al., 2023	UK	Systematic review of RCTs	51 RCTs (varied N)	Socioeconomically deprived adults, mainly with type 2 diabetes	Standard education/usual care	3–18 months
Song et al., 2021	Netherlands	Systematic review & meta-analysis of RCTs	4,120	Adults with COPD or asthma	Standard care/education	3–12 months
Tang et al., 2023	China	Factorial design, superiority trial (2-center RCT)		Adults (≥18 years) with T2DM, HbA1c ≥ 7.0%, smartphone literate	Routine care + standard T2DM education only; or routine care + reminders	6 months
Lee et al., 2021	China	Assessor-blinded randomized controlled trial (protocol)	198	Hypertensive adults with non-dipping systolic BP pattern	Usual care	12 months
Adejumo et al., 2021	Nigeria	Cross-sectional study	141	50 haemodialysis CKD patients, 41 pre-dialysis CKD patients, 50 controls	HD vs pre-dialysis CKD vs controls	Not applicable
Nick et al., 2021	Multiple countries	Quantitative systematic review (9 RCTs, 3 quasi-experimental studies)	1,923 participants	Community-dwelling adults (≥18 years) with heart failure, NYHA Class I–IV	Usual care	1997–2019 (varied by included study)
Scott et	United	Service	134	Adults with rheumatoid	Pre-module	Launche

al., 2024	Kingdom	evaluation survey	respondents (27% of 500 invited)	arthritis (95%) or other inflammatory arthritis (5%), mostly aged 61–80 years, 83% female	self-assessment (same participants)	d Sept 2021; survey conducted March–May 2024
Liu et al., (2020).	Multiple countries (27 RCTs)	Systematic review and meta-analysis of RCTs	27 trials	Adults with type 2 diabetes and/or hypertension	Usual care or alternative interventions	Trials published Jan 2007–Jan 2019; individual RCT durations varied
Sahlin et al., 2021	Sweden	Multicenter randomized controlled trial	118 (mean age 79 years, 39% female, 45% EF <40%)	Patients with heart failure	Standard care alone	240 days
Yoon et al., 2024	South Korea	Prospective multicenter randomized controlled trial	77 (Intervention: n=39; Control: n=38; age ≥20 years)	Patients hospitalized for acute heart failure, able to use a smartphone	App with manual BP, HR, and weight entry (non-Bluetooth), no feedback or alerts	4 weeks
Okazaki et al., 2024	Japan	Cluster randomized controlled trial (protocol)	Planned: 210 participants from 40 facilities	Adults ≥18 years, chronic HF, Stage C (ACCF/AHA classification)	Usual care	Follow-up up to 1 year
Roussia et al., 2023	United Arab Emirates	One-group quasi-experimental pretest–posttest	30	Adults with HF (76.6% male; 56.7% over 60 years old)	None	(pre–post timeframe)
Yu et al., 2024	Hong Kong	Double-blind randomized controlled trial	88 HF patient–carer dyads	Heart failure patients (mean age 76.8 ± 9.4; NYHA II: 56%, NYHA III: 44%; mean LVEF = 42.5%) and their family carers	Dialectic education program	16 weeks
Philippou et al.,	Cyprus (based	Sub-analysis of	121 patients	Patients with heart failure and diabetes	Usual care	1 year, with

2024	on author affiliations and context)	randomized clinical trial (pragmatic RCT)		mellitus; 66% male		assessments at baseline, 1 month, 3 months, 6 months, and 1 year
Luo et al., 2024	China	Retrospective cohort study	308 patients (151 intervention, 157 control)	Patients with heart failure treated at a tertiary care hospital	Routine nursing care	2 years
Pons-Riverola et al., 2023	Spain	Randomised controlled trial (post-hoc analysis of iCOR study)	178 patients	Recently hospitalised heart failure patients in a nurse-based, integrated HF management programme	Usual care (integrated HF management without telemedicine)	6 months
Puspitawati & Widani, 2024	Not specified	Systematic review	Not specified (multiple studies reviewed)	Patients with heart failure	Usual care (non–nurse-led or standard management)	Varied across included studies
Khanipour-Kencha & Zakerimoghadam, 2023	Iran	Randomised controlled trial (protocol)	96	Patients with heart failure	Usual care	10 weeks

HbA1c=Glycated haemoglobin, indicating long-term glycaemic control (average blood glucose over approximately 2–3 months). NYHA=New York Heart Association functional classification, which grades heart failure severity from Class I (no symptoms) to Class IV (symptoms at rest). ACCF/AHA=American College of Cardiology Foundation/American Heart Association heart failure staging (Stages A–D, from risk to advanced disease). CAD= Coronary Artery Disease

Comparison of interventions

Comparators were typically standard care, usual educational materials, or non-digital equivalents of the intervention. The duration of interventions ranged from four weeks to two years [22, 25], with follow-up periods in some studies extending to 12 months [25]. The primary outcomes most frequently assessed were self-care behaviour scores, disease-specific clinical indicators [23, 26], quality of life (QoL) [24, 26], and hospital readmission rates [22, 28]. Secondary outcomes included blood pressure [28], glycaemic control [25], ejection fraction [26], symptom burden [23], and various psychosocial measures [23, 34, 38].

Table 2: Intervention, outcomes and key results

Authors & Year	Intervention	Primary Outcomes	Key Results
Ye et al., 2024	WeChat-based telehealth education + standard diabetes education	Fasting glucose, HbA1c, BP, LDL-C, self-management score	Significant reductions in weight, BMI, fasting glucose, 2h-PG, HbA1c, SBP, LDL-C; improved self-management in diet, exercise, glucose monitoring, medication adherence
Han et al., 2023	Telemedicine-assisted structured SMBG	HbA1c, SMBG frequency, self-management	Improved glycemic control and SMBG adherence; enhanced diabetes self-management
Lee et al., 2022	Education, self-monitoring, behavior change support	Disease-specific clinical indicators, QoL	Small but significant overall benefit (Hedges' g = 0.29) across multiple conditions
Huang et al., 2024	Self-monitoring, education, problem-solving, motivational interviewing	QoL, self-efficacy, anxiety, depression	↑ QoL (SMD = 0.27), ↑ self-efficacy (SMD = 0.32), ↓ depression (SMD = –0.24), no change in anxiety
Okpako et al., 2023	Tailored education, peer-support, culturally adapted guidance	HbA1c	↓ HbA1c by –0.29%, improved adherence and diet behaviors
Song et al., 2021	Digital self-management + in-person coaching	QoL, exacerbations	↑ QoL (SMD = 0.21), ↓ exacerbations (RR = 0.88)
Tang et al., 2023	Routine care + standard T2DM education + smartphone app (glycemic control & health management) ± weekly telephone reminders	HbA1c	Secondary outcomes include BG monitoring frequency, BMI, BP, diabetes knowledge, health beliefs, self-management behaviors, satisfaction with app
Adejumo et al., 2021	None (observational)	Self-perceived burden, quality of life, anxiety, depression	Depressive symptoms: 46.2% in CKD; anxiety: 33.0% in CKD. QoL significantly lower in CKD vs controls ($p<0.001$), and in HD vs pre-dialysis CKD ($p<0.001$). Self-perceived burden higher in HD vs pre-dialysis CKD ($p<0.001$). QoL negatively correlated with self-perceived burden, anxiety, and depression ($p<0.001$).
Nick et al., 2021	Telemonitoring (telephone-based support, interactive websites, mobile apps, remote monitoring systems/devices)	Self-care behaviors (European Heart Failure Self-care Behaviour Scale, Self-care of Heart Failure Index)	Telemonitoring improved self-care behaviors in 10 of 12 studies (statistically significant), with clinical significance in 9 of 12. Moderate–high study quality, but limitations included lack of blinding, sample size, and variation in reporting. Evidence insufficient on long-term sustainability of effects.
Scott et al., 2024	NRAS online learning module on managing pain and flares (part of SMILE-RA program)	Self-reported knowledge and confidence in managing pain and	Knowledge at managing pain improved from 62% to 95% ($p=0.01$) and flares from 52% to 93% ($p<0.01$). Confidence at managing pain improved from 50% to

		flares; likelihood of using module suggestions	90% (p<0.01) and flares from 44% to 90% (p<0.01). 79% and 78% were likely to use module suggestions for pain and flares, respectively. Participants valued trustworthy information and felt more able to self-manage with less reliance on medication.
Liu et al., (2020).	Mobile app-assisted self-care interventions (features included BG/BP monitoring, medication monitoring, provider communication, automated feedback, goal setting, reminders, education, data visualization)	Changes in HbA1c, systolic BP (SBP), diastolic BP (DBP); other clinical, behavioral, knowledge, and psychosocial outcomes	Significant reductions in HbA1c (SMD −0.44, 95% CI −0.59 to −0.29; P<.001), SBP (SMD −0.17, 95% CI −0.31 to −0.03; P=.02), and DBP (SMD −0.17, 95% CI −0.30 to −0.03; P=.02). Lower fasting blood glucose and waist circumference observed. Mixed results for other secondary outcomes.
Sahlin et al., 2021	Home-based mobile device for self-care education, symptom monitoring (objective & subjective), and loop diuretic adjustment, in addition to standard care	Self-care (European Heart Failure Self-care Behavior Scale); HF-related in-hospital days	Improved self-care scores vs control (median 26 vs 21.5; p=0.014); fewer HF-related in-hospital days (−2.2 days, RR=0.48, 95% CI 0.32–0.74, p=0.001)
Yoon et al., 2024	Smartphone app with Bluetooth-connected monitoring devices; daily entry of vitals, HF symptoms, diet, meds, and exercise; automated feedback and alerts	Change in dyspnea symptom score	Greater reduction in dyspnea score (–1.3 ± 2.1 vs –0.3 ± 2.3; P=0.048); significant reduction in body water composition (P=0.003); higher app adherence; no significant difference in composite events (death, rehospitalization, urgent HF visits)
Okazaki et al., 2024	Nurse-led structured support: weekly follow-ups (phone calls) for 1 month, then monthly; focus on stability, medication adherence, and self-management	Improvement/maintenance of self-care behavior (EHFScBS scores)	Protocol only – no results yet (secondary outcomes: readmissions at 30 days, 3, 6, and 12 months; duration of home care; BNP and NT-proBNP levels)
Roussia et al., 2023	Roy Adaptation Theory–guided educational program on HF self-care	Knowledge, self-care maintenance, self-care monitoring, self-care management (measured with instrument based on Roy's theory)	Adequate self-care knowledge improved from 16.7% pre-test to 93.3% post-test (p<.001); significant improvement in self-care practices (p<.001); no significant association between demographics and outcomes
Yu et al., 2024	16-week Dyadic Empowerment-based	Health-related quality of life	De-HF group showed significantly greater improvements in self-care maintenance

	HF Management (De-HF) Program (dyadic assessment, five online empowerment modules, follow-up telecare; scenario-based training, teach-back, goal-setting)	(HRQL) of dyads; patient self-care (maintenance, management, symptom perception); shared care; perceived control	(+7.15, p=0.009), management (+10.04, p=0.004), symptom perception (+15.59, p<0.001); HRQL (MLHF score −11.45, p=0.001); improved perceived control (p=0.001), joint decision-making (p=0.001), reciprocity (p=0.026)
Philippou et al., 2024	Individualized supportive care management program (intensive, early-stage, person-centered)	Self-care management (Gr-SCHFI) and self-care behaviors (Gr9EHFScBS)	Statistically significant improvements in all SCHFI dimensions (maintenance, management, self-confidence) and all EHFScBS dimensions (adherence to recommendations, fluid/sodium management, physical activity/recognition of symptoms) at all follow-up points (all p < 0.001). Improvements were progressive over time, largest at 1-year follow-up.
Luo et al., 2024	IMB model-based nursing intervention (information delivery, motivation enhancement, behavioral skills training)	Self-care behavior (SCHFI), quality of life (MLHFQ), hemodynamic parameters (LVESD, LVEDD, LVEF)	Intervention group showed significantly better SCHFI and MLHFQ scores and improved LVESD, LVEDD, and LVEF compared to control (all p<0.05), confirming superior efficacy of IMB model-based nursing.
Pons-Riverola et al., 2023	Telemedicine (eHealth-based telemonitoring and tele-intervention added to existing care)	Change in self-care behaviour (EHFScBS-12; lower scores = better self-care)	Both groups improved over time, but TM group had greater improvement (Δ -7.9±11) vs UC (Δ -2.2±10.4), p<0.001; baseline self-care and randomisation arm were independent predictors of improvement.
Puspitawati & Widani, 2024	Nurse-led self-care management education programs	Self-care behavior, quality of life (MLHFQ), all-cause and HF-related readmission, all-cause mortality	Nurse-led education improved self-care and quality of life, reduced HF-related and all-cause readmissions, and lowered mortality; demonstrated cost-effectiveness.
Khanipour-Kencha & Zakerimoghadam, 2023	Comprehensive tele-empowerment programme (6 weeks of virtual group sessions via internet + 4 weeks follow-up)	Self-care behaviours, uncertainty; secondary: hospital readmissions	Results not yet reported (protocol); planned analysis includes self-care improvement, reduced uncertainty, and fewer readmissions.
Lee et al., 2021	Combined aerobic + resistance training program (“exercise is medicine”) + usual care; includes 12-week exercise classes, mobile app, wrist trackers, self-scheduling, monitoring,	Primary: Proportion of participants with non-dipping BP pattern at 3 months; Secondary: Proportion with ND	Protocol paper- results not yet reported

	feedback, and motivational interviewing	at 12 months, absolute BP values at 3 and 12 months, exercise level	

SMBG= Self-Monitoring of Blood Glucose. BMI= Body Mass Index. MLHFQ: Minnesota Living with Heart Failure Questionnaire. LDL-C= Low-Density Lipoprotein Cholesterol. LVESD= Left Ventricular End-Systolic Diameter. LVEDD=Left Ventricular End-Diastolic Diameter. LVEF= Left Ventricular Ejection Fraction. Gr-SCHFI= Greek version of the Self-Care of Heart Failure Index. Gr9EHFScBS= Greek version of the 9-item European Heart Failure Self-care Behaviour Scale. SMILE-RA= Self-Management Intervention through Lifestyle Education in Rheumatoid Arthritis. De-HF =Deprescribing in Heart Failure.

Description of interventions

Improvement in self-care behaviour emerged as the most consistent finding across the included trials. In HF populations, interventions such as telemonitoring, nurse-led supportive programmes, dyadic empowerment approaches, and structured educational care all yielded statistically significant gains in self-care scores. For example, the De-HF programme in Hong Kong produced significant improvements in self-care maintenance (mean difference = +7.15, p = 0.009), self-care management (+10.04, p = 0.004), and symptom perception (+15.59, p < 0.001) compared to education alone [23]. Similarly, integration of telemedicine into an existing HF care programme resulted in a mean improvement in the European Heart Failure Self-care Behaviour Scale (EHFScBS-12) score of –7.9 compared to –2.2 for usual care (p < 0.001) [27]. In another study, a nurse-led supportive care programme targeting HF patients with comorbid diabetes mellitus demonstrated progressive and statistically significant improvements across all domains of both the Self-Care of Heart Failure Index (SCHFI) and the European Heart Failure Self-Care Behaviour Scale (EHFScBS) at each follow-up point up to one year [25]. Retrospective cohort data from China further confirmed the benefit of Information–Motivation–Behavioural Skills (IMB) model-based nursing, with significantly higher SCHFI scores than those achieved by routine nursing care (p < 0.05) [26]. Meta-analytic evidence also supported the role of telemonitoring in HF self-care, with ten out of twelve included studies reporting significant improvement [28].

Quality of life was another consistently improved outcome. In HF, the Minnesota Living with Heart Failure Questionnaire (MLHFQ) was the most frequently used measure [24]. The De-HF programme achieved a reduction in MLHFQ scores of –11.45 points (p = 0.001) [24], and the IMB model-based nursing intervention also yielded significant gains [26]. Meta-analytic evidence across chronic conditions reported pooled small-to-moderate improvements in QoL, with one review estimating a standardised mean difference (SMD) of 0.27 [28]. In one trial, use of a mobile device to support HF self-care reduced HF-related in-hospital days by 2.2 days (relative risk = 0.48, p = 0.001). A systematic review found that nurse-led education programmes in HF reduced both HF-related and all-cause readmissions, as well as mortality [28].

Psychological and behavioural outcomes also showed improvement. Dyadic interventions in HF significantly enhanced perceived control (p = 0.001) and collaborative disease management behaviours, including joint decision-making and reciprocity [24]. A systematic review of self-care interventions in chronic disease populations reported improvements in self-efficacy and reductions in depression, though no statistically significant change in anxiety levels was detected [28]. Pooled meta-analyses of self-care interventions in chronic diseases typically reported small-to-moderate effects, with Hedges' g values

between 0.21 and 0.32 [28]. In contrast, individual trials sometimes achieved large effects, such as the De-HF programme's Cohen's d of 0.928 for symptom perception [24]. Improvements in clinical indicators such as HbA1c [26], blood pressure [25], and echocardiographic measures [26] were statistically significant and, in some cases, clinically meaningful, suggesting that the observed behavioural changes had tangible health impacts.

4. DISCUSSIONS

Despite the promising evidence supporting self-care interventions in managing chronic diseases, this review reveals a notable paucity of high-quality data across several conditions and intervention modalities. Although 22 studies met the inclusion criteria, many potential studies were excluded due to irrelevant outcomes, inappropriate designs, or unclear definitions of self-care, highlighting inconsistencies in conceptualisation and reporting within the field. Moreover, the limited number of studies addressing conditions beyond heart failure and type 2 diabetes indicates gaps in research on other prevalent chronic illnesses such as hypertension, chronic kidney disease, and COPD. The geographic distribution, while diverse, also points to the under-representation of low-resource settings, where the burden of chronic diseases is substantial but research capacity may be limited. Variation in intervention components and outcome measures complicates comparison and synthesis of results, necessitating standardised frameworks and robust longitudinal trials.

The comparison of self-care interventions against standard care or non-digital equivalents across the included studies provides valuable insights into their relative effectiveness in managing chronic diseases. Intervention durations varied substantially, ranging from short-term programmes of four weeks to extended interventions lasting up to two years, with some studies incorporating follow-ups extending to 12 months. This variability reflects differing approaches to sustaining behaviour change and clinical improvements over time. Consistently, primary outcomes focused on self-care behaviour scores, disease-specific clinical indicators, quality of life (QoL), and hospital readmission rates, underscoring the multidimensional impact of self-care on both patient-centred and healthcare utilisation endpoints. Improvements in self-care behaviours were frequently associated with positive changes in clinical parameters such as blood pressure, glycaemic control, and ejection fraction, indicating that enhanced patient engagement can translate into measurable health benefits. Moreover, reductions in hospital readmissions and symptom burden further highlight the potential of self-care interventions to alleviate healthcare system pressures while improving patient well-being. The inclusion of psychosocial outcomes emphasises the holistic nature of chronic disease management, recognising that mental and emotional health are integral to effective self-care.

The interventions reviewed consistently demonstrated significant improvements in self-care behaviours, particularly within heart failure (HF) populations, stressing the critical role of structured and supportive approaches in enhancing patient engagement [11, 22-27]. Telemonitoring and nurse-led supportive programmes emerged as especially effective strategies, with multiple studies reporting statistically and clinically meaningful gains across various validated self-care measures [27-29]. For instance, the De-HF programme in Hong Kong showed substantial improvements not only in self-care maintenance but also in management and symptom perception domains, suggesting that comprehensive education combined with empowerment can enhance patients' ability to monitor and respond to their condition effectively [31]. Similarly, integration of telemedicine within HF care yielded superior outcomes compared to usual care, underlining the potential of remote monitoring technologies to facilitate continuous patient–provider interaction and timely interventions [31]. The robustness of these findings is further supported by longitudinal evidence from nurse-led interventions targeting patients with HF and comorbid diabetes, where

improvements in self-care behaviour were sustained over extended follow-up periods [25]. The retrospective cohort study reinforcing the effectiveness of the Information–Motivation–Behavioural Skills (IMB) model-based nursing adds another dimension, emphasising the value of theory-driven frameworks in guiding intervention design. Meta-analytic data corroborate these positive outcomes, particularly in relation to telemonitoring, reflecting consistency across diverse settings and populations [27].

The reviewed evidence indicates that self-care interventions consistently contribute to improvements in quality of life (QoL) among patients with chronic diseases, particularly those with HF. The Minnesota Living with Heart Failure Questionnaire (MLHFQ), frequently used to assess QoL in HF populations, demonstrated significant reductions in symptom burden and life impact scores following interventions such as the De-HF programme and the Information–Motivation–Behavioural Skills (IMB) model-based nursing approach [24]. Findings across chronic conditions further corroborate these benefits, reporting pooled small-to-moderate effect sizes, indicative of meaningful, albeit modest, gains at the population level [28]. Importantly, these QoL improvements were paralleled by reductions in hospital readmissions and in-hospital days, as evidenced by trials employing mobile health tools and nurse-led education programmes, emphasising the potential for self-care strategies not only to enhance patient-centred outcomes but also to alleviate healthcare burdens.

In addition to QoL, psychosocial and behavioural outcomes were positively influenced by self-care interventions. Dyadic approaches in HF populations improved perceived control and collaborative disease management behaviours, which are critical for sustained self-care adherence and psychological well-being. Findings from systematic reviews reported some variation, with consistent enhancements in self-efficacy and reductions in depressive symptoms; meta-analyses showed small-to-moderate overall effects, while some individual trials achieved large effect sizes for specific outcomes [28, 31]. Clinical indicators such as HbA1c, blood pressure, and heart function showed significant improvements, indicating that behavioural changes lead to tangible health benefits [25, 26].
This systematic review demonstrates several strengths that enhance the reliability and validity of its findings. The review process was conducted with strong methodological rigour, adhering to established guidelines including PRISMA to ensure transparency and reproducibility. A comprehensive and systematic search strategy was developed in consultation with a research librarian to capture a broad range of relevant studies from multiple databases. Moreover, the screening, data extraction, and quality assessment were independently performed by two reviewers to minimise bias, with disagreements resolved through discussion among the wider author team. These measures collectively support the robustness of the review's conclusions.

Nevertheless, some limitations must be acknowledged. The included studies exhibited considerable heterogeneity in intervention types, outcome measures, and follow-up durations, which complicated direct comparisons and precluded quantitative synthesis through meta-analysis. Variations in the definition and implementation of self-care interventions across studies limited the ability to clearly delineate which specific components were most effective. The geographic and population diversity, while a strength in terms of generalisability, also introduced contextual differences that may affect intervention applicability in different settings. Finally, potential publication bias cannot be fully excluded, given the exclusion of non-English publications and some grey literature. Future research with standardised intervention frameworks and outcome measures is needed to address these gaps and strengthen the evidence base for self-care interventions in chronic disease management.

5. CONCLUSION

Self-care interventions have shown a positive impact on the management of chronic diseases, particularly heart failure, diabetes mellitus, and hypertension. Evidence demonstrates consistent improvements in self-care behaviours, quality of life, clinical outcomes, and healthcare utilisation across diverse populations and healthcare settings. Interventions incorporating technology, nurse-led education, and theory-driven behavioural support appear particularly effective in enhancing patient engagement and health outcomes. Nonetheless, the variability of intervention designs and outcome measures, together with limited data on certain chronic conditions and settings, underscores the need for further high-quality, standardised research. Future efforts should prioritise optimising intervention components and tailoring strategies to different patient populations to maximise the clinical and psychosocial benefits of self-care in chronic disease management.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used ChatGPT to generate article structure and Grammarly was used to improve the readability of the document. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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